



**Testimony of Deron Lovaas
Federal Transportation Policy Director
Natural Resources Defense Council**

**Opportunities to Improve Energy Security and the Environment
through Transportation Policy**

**Environment and Public Works Committee
March 24, 2010**

Chairman Boxer and Senators of the Committee, thank you for the opportunity to discuss with you the important and timely topics of energy security, the environment and transportation policy. My testimony will cover various issues:

- I. Energy and Climate Security
- II. The Danger of Environmentally Damaging and Expensive Substitutes
- III. Solving Energy and Climate Security Threats by Saving Oil
- IV. Saving Oil Via Better Fuel Economy Performance
- V. Saving Oil by Electrifying Transportation
- VI. NRDC Priorities for Transportation Policy
 - a. Reducing U.S. transportation sector oil use and greenhouse gas pollution
 - b. Increase the number of locations accessible by transit, biking and walking
 - c. Spur creation of good jobs with clean transportation investments
- VII. Saving Oil by Delivering Mobility Choice
 - a. Ensure the Price of Fuel Better Reflects Oil Security Costs

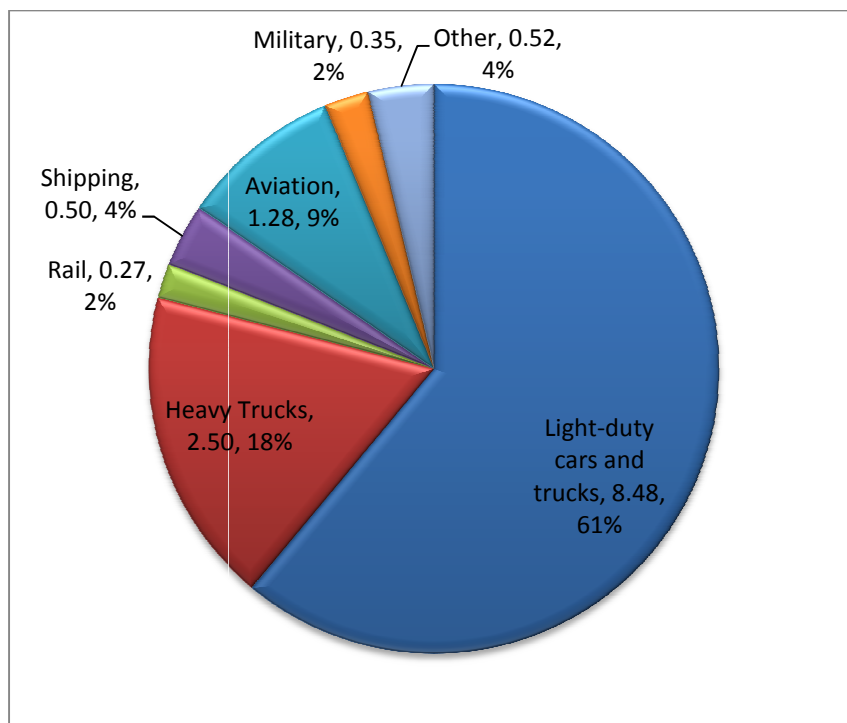
- b. Deploy “HOT” Lanes and Congestion Pricing
- c. Allocate Transit Dollars to Optimize Oil Savings
- d. Increase Insurance Choice
- e. Provide Transit Vouchers for Mobility Choice for Low-Income Households
- f. Increase Commuting Options and Telecommuting
- g. Return Gas Tax Revenues to Areas with the Most Traffic and Oil Savings Potential
- h. Improve Local Land-Development Rules
- i. Deployment of Smart Traffic Management
- j. Deploy Cost-Effective Intercity Rail Options as Justified by Cost Efficiency and Oil Displacement Potential

VIII. Securing Our Energy and Climate Future

Energy and Climate Security

Transportation drives America's dependence on foreign oil. While we have weaned the electricity sector almost completely off oil, with some notable exceptions such as Hawaii, transportation remains 96-percent dependent on petroleum products, mostly gasoline and diesel.¹ As the graph below shows, the biggest single sub-sectoral oil consuming category is light-duty vehicles, which account for about 60 percent of the total.² Heavy-duty vehicles comprise about one-third that percentage, and aviation about half of that. The remainder is rail, marine and other uses.

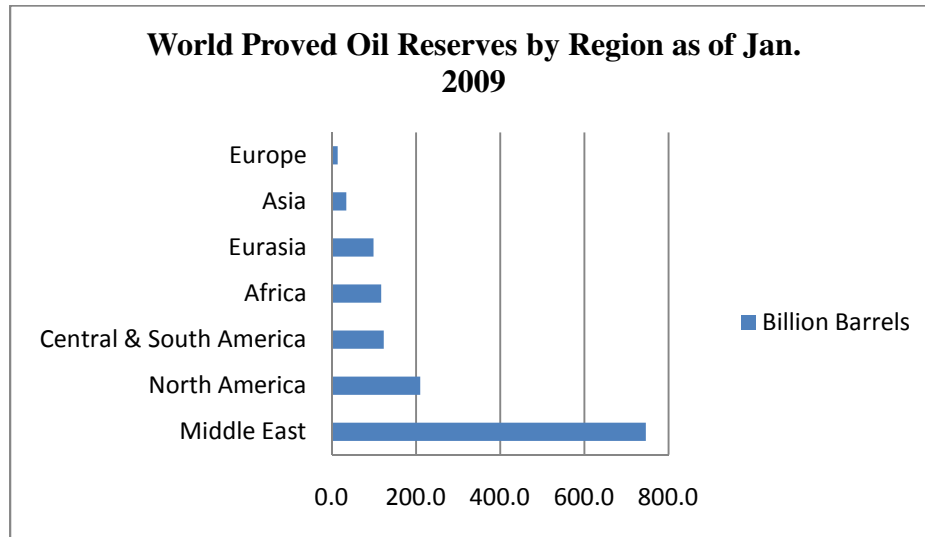
Transportation Energy Consumption in 2009
(million barrels per day oil equivalent)



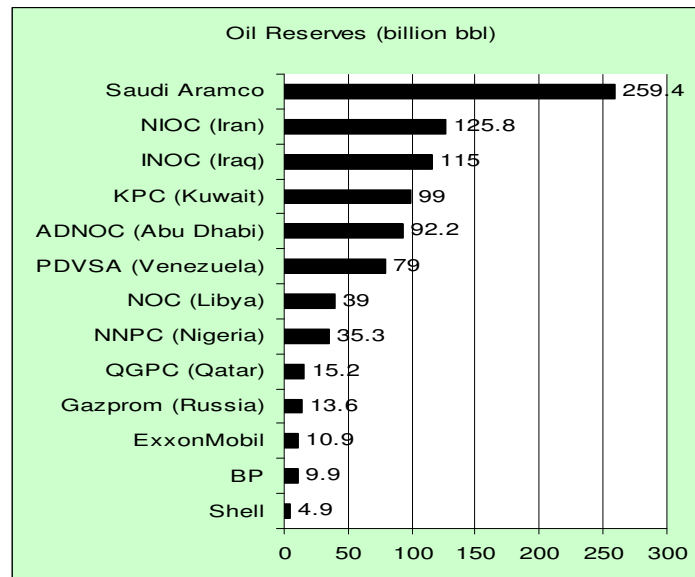
Taken together, our oil consumption adds up to a 20 million-barrel-per-day habit. This tremendous thirst for oil is a concern because the vast majority of oil resources are held by other nations.

Oil production in the United States peaked circa 1970, despite tremendous investments in exploration and production. The U.S. has 560,000 producing oil wells versus Saudi Arabia's 1,500, for example -- as well as thorough subsurface mapping.³ To meet our gargantuan demand oil imports have risen steadily from 35 percent in 1973 to more than 60 percent now, a situation unlikely to change except via demand moderation since other countries have vaster reserves and therefore longevity of production capacity.⁴ The graph below illustrates this, and the bitter irony is that the more rapidly we deplete our remaining domestic reserves in order to cut imports for the short-term, the more we tilt

the long-term playing field in favor those nations that already have much better positions vis-à-vis reserves and production capacity.



This imbalance is further exacerbated by the remarkable rise of national oil companies. Big, private oil companies are not as influential in the global oil game as they once were. Now, companies affiliated with nation-states loom large, owning about 90 percent of the world's remaining reserves as shown in the graph below.⁵



This increasing nationalization of resources gives the modern-day global oil marketplace some disturbing characteristics. These state players, especially if they cooperate as part of the global cartel of Oil Producing and Exporting Countries or OPEC, tend to push the price of oil upwards to ensure adequate revenue. Some also tend to underinvest in production capacity. As the Director of Harvard's Environment and Natural Resources Program Henry Lee put it, therefore "consuming countries will find themselves paying

more to import oil, which will affect their current accounts and their economic growth levels...”⁶ And in the past decade we have indeed paid quite a bit, not just in aggregate but as individual consumers. A recent report quantified it in a novel way in a recent report, finding that the rise in gasoline prices cost the average consumer \$1,990 more a year in 2008 compared to 2001. This figure happens to be almost exactly the amount saved by the median household due to cumulative changes in the tax code during that same time period (\$1,900), meaning that tax cuts were trumped by payments at the pump.⁷

A host of possible events could exacerbate this alarming situation further, including:

- Potential attacks on oil production facilities or pipelines by non-state actors, as evidenced by al Qaeda itself urging its followers to attack “the umbilical cord and lifeline of the crusader community”;⁸
- Direct support of terrorist activities by some oil-rich nations with significant wealth, and especially alarming in light of the sheer size of revenues to such nations (for example, OPEC’s net annual revenues soared ninefold to almost a trillion dollars in the ten years ending with 2008 before dropping due to the recession, according to the Energy Information Administration);⁹
- Increasing resource conflicts within and between nations over land-based and offshore oil deposits, requiring us to “acknowledge and live with varying degrees of insecurity” as summed up by former Secretary of Defense and Energy James R. Schlesinger in 2005 Senate testimony;¹⁰
- Potential disruption of supply from state-owned firms and foreign actors, such as Iran and Venezuela, with the largest reserves and production capacity should they decide to use the “oil weapon” again as in the 1970s oil embargoes;
- Empowerment of the powerful monopolistic cartel OPEC, whose 13 members control more than three-quarters of the world’s oil reserves and whose members have an interest in continued U.S. oil addiction, or as Saudi Oil Minister Ali Naimi told fellow members in 2004 “environmental and energy security concerns have been channeling technologies and research towards alternate fuels...the research and investment in those technologies pose long-term challenges to the oil industry in general and to the NOCs [national oil companies] including our own.”¹¹

Any of these factors could limit oil supply, putting constraints on U.S. transportation and industry and driving global oil prices upward. Repeated simulations have demonstrated that such a combination of disruptions could send a real shockwave through the U.S. economy.¹² We saw a vivid demonstration of the impact of price shocks on our economy just a couple of years ago, when a combination of factors drove oil prices to nearly \$150 per barrel, causing the national average gasoline price to \$3.59 in July, 2008; at some

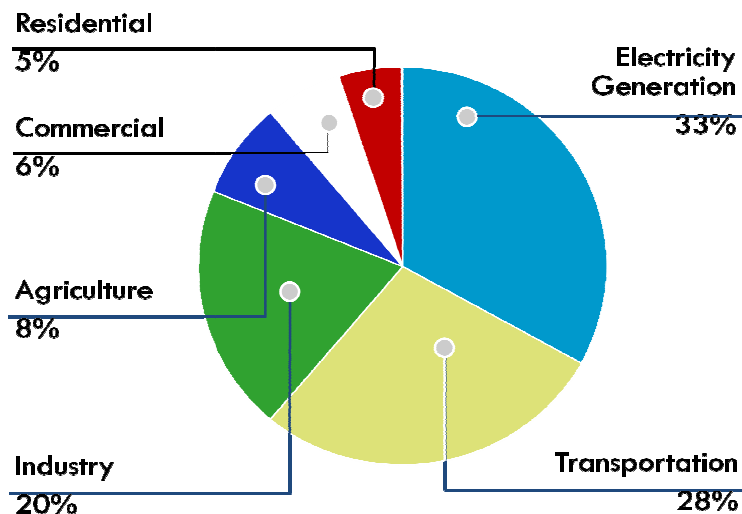
retailers the price even jumped above \$4, prompting *New York Times* columnist Tom Friedman to pen a column calling it our “4/11” moment.¹³

Overall oil intensity of the U.S. economy – the amount of oil used per unit of GDP – has declined substantially since the 1970s due to greater energy efficiency and fuel switching.

However, this has not been the case in the transportation sector, which therefore remains shackled to global oil marketplace trends. Therefore repercussions of oil price increases and spikes can be severe and widespread. High oil prices have an immediate impact on transportation costs for both households and businesses. As transportation costs rise, goods and services that must be transported also rise in price. Food, consumer goods, raw materials, and other fundamentals of our economy are all simultaneously affected. Our economy is therefore held hostage to a fickle and at times turbulent global oil market, which is influenced by diverse factors such as consumer behavior in other large growing nations such as China and supply decisions made by unaccountable oil monopolies, often with state ties or ownership. This fact poses a significant economic threat which we would have little ability to address in the short term.

Apart from economic impacts, our oil dependence poses a national security concern for strategic military and defense reasons. Oil consumption in the U.S. driven by the transportation sector is a major source of heat-trapping pollution, accounting for approximately one-third of U.S. greenhouse gas emissions as shown in the graph below.

US GHG Emissions by End Use Economic Sector 2006



Source: Environmental Protection Agency (EPA). “Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2007,” April 2009, <http://epa.gov/climatechange/emissions/usinventory.html>.

In addition to the numerous environmental impacts of climate change, which have been well documented before this Committee, climate change carries worrisome security implications. An increasing number of security experts at CNA Corporation, the Center for Strategic and International Studies as well as the Defense Department have identified climate change as a challenge to the nation. CNA describes a “threat multiplier” effect due to climate change whereby regions of the world that are already stressed due to poor social, economic and/or political conditions risk degenerating into disaster and/or civil war zones with additional stress due to the unpredictable impacts of climate change.¹⁴ Asian, African and Middle Eastern countries are particularly susceptible to such a scenario. As CNA sums up:

Economic and environmental conditions in already fragile areas will further erode as food production declines, diseases increase, clean water becomes increasingly scarce, and large populations move in search of resources. Weakened and failing governments, with an already thin margin for survival, foster the conditions for internal conflicts, extremism, and movement toward increased authoritarianism and radical ideologies.¹⁵

In its latest review, the Defense Department essentially concurs, stating among other things that “While climate change itself does not cause conflict, it may act as an accelerant of instability or conflict, placing a burden to respond on civilian institutions and militaries around the world.”¹⁶

The Danger of Environmentally Damaging and Expensive Substitutes

As NRDC research, analysis and advocacy has described before, as conventional oil supply and production capacity struggles to keep up with seemingly insatiable demand, the energy industry is tapping harder-to-exploit resources.¹⁷ These so-called “unconventional” resources include, for example, the tar sands of Alberta, Canada, where more than one million barrels a day of this resource are being extracted.

“Extracted,” however, is a euphemism. This very diffusely deposited substance is mined using the world’s largest trucks in a process that has denuded hundreds of acres of boreal forest and could ultimately destroy the land cover of an area the size of Florida. Not only does this mean the loss of pristine forest and migratory bird species that rely on it for habitat, it dramatically increases the life-cycle carbon emissions of the final product because the extraction and refining process is so much more energy-intensive.

Some analysts project ever-greater reliance on such unusual energy resources:

Indeed, a process of ‘deconventionalization’ of reserves is taking place that will probably make the future supply of oil the result of a mosaic of many increments, many of them relatively small, coming from both new and traditional producing countries, and from unconventional sources such as gas liquids, ultra-deep offshore deposits, ultra-heavy oils, shale oils, and tar sands.¹⁸

Fortunately these trends aren't destiny, since 'deconventionalization' in some cases means more 'carbonization' of the fuel mix, steering us away from the Scylla of supply constraints and towards the Charybdis of expensive energy, likely conflicts over resources, and widespread environmental damage including climate change.

Solving Energy and Climate Security Threats by Saving Oil

What is to be done to address the energy and climate security threats confronting us? We must put together a strategy to reduce our dependence on this resource, with some specific objectives in mind. The first is to further reduce the economy's oil intensity. The good news is that we have done this before. Specifically, oil intensity dropped by one-third between 1978 and 1985, such that every \$1,000 of gross domestic product (GDP) required just one barrel of oil to create.¹⁹ This was mostly policy-driven (although prices played a role), and due in part to shifting to other sources of energy for electricity generation and to dramatic increases in fuel economy thanks to the new Corporate Average Fuel Economy (CAFE) mandates included in the 1975 energy bill (EPCA, P.L. 94-163).²⁰ However, reductions in intensity slowed down in the late 1980s. We must make a concerted effort to drive them down further, to insulate the economy from price increases and shocks.

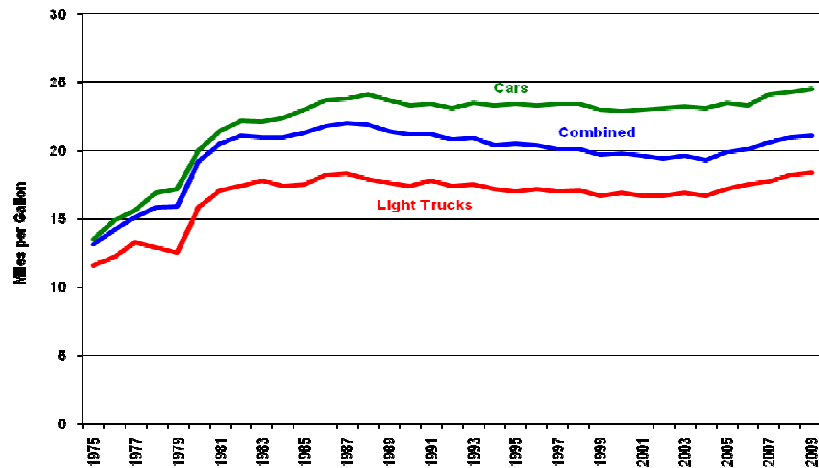
A loftier goal enunciated by Anne Korin of the Institute for the Analysis of Global Security is transform oil into just another commodity, as opposed to one that has a stranglehold on our transportation system. Anne reminds us that salt was once a strategic commodity, with nations going to war over this resource.²¹ That changed when viable substitutes for meat preservation were developed, such as refrigeration. As Jim Woolsey and Chelsea Sexton sum up in a recent essay:

For a number of reasons we must strive to set oil on a similar path of decline in influence—away from being a strategic commodity and toward being simply a commodity. Oil will still be useful and valued for its high energy content and its relative ease of shipment for a long time. It will also be used in heating and in the production of some chemicals, although in those uses it is already, in a sense, no longer a strategic commodity because it has competitors. Doubtless it will be used for many years to produce transportation fuel as well. But in the interests of our national security, our climate, and our pocketbooks, we should move together as a nation to destroy, not oil of course, but oil's strategic role in transportation as quickly and as thoroughly as possible.²²

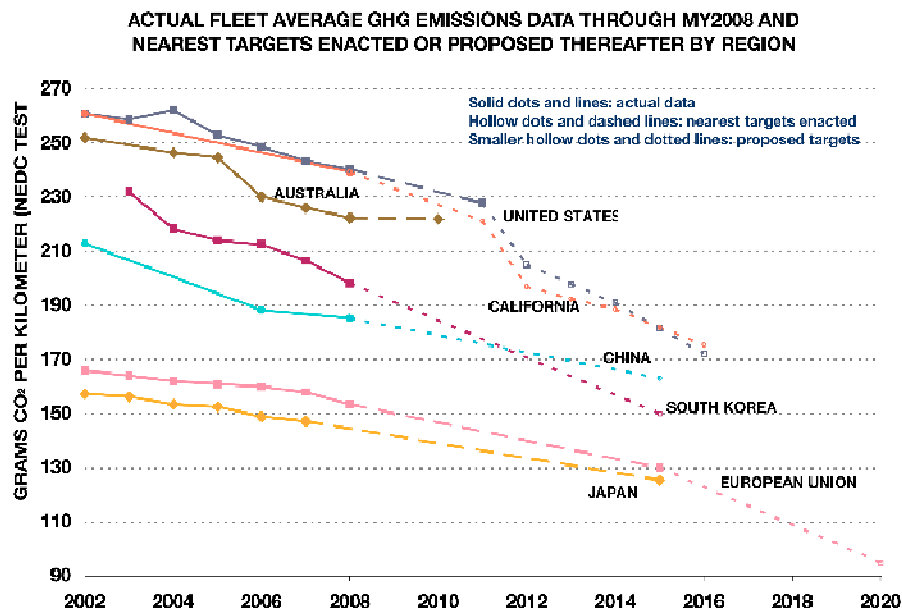
Saving Oil Via Better Fuel Economy Performance

Enactment of the Energy Independence and Security Act of 2007, or EISA (P.L. 110-140), boosted fuel economy standards for the first time in decades. This important policy driver is finally raising the bar again for fuel economy performance of our cars and trucks. This is important since the last time fuel economy jumped substantially during the mid-1970s and 80s it was due only part to increasing prices and more to enactment and

enhancement of these standards (called Corporate Average Fuel Economy or CAFE).²³ This initial boost and then the stagnation that followed until the past few years is shown in the graph below.²⁴



Last year, as one of its first and most effective actions, the Obama Administration took advantage of the fact that Congress established a floor, not a ceiling, for new standards by promulgating a joint DOT-EPA rule for increasing performance of the vehicle fleet even faster. The upshot is that the U.S. light-duty vehicle fleet is slated to achieve 35.5 miles per gallon by 2016. This is about a 40 percent jump from the status quo ante, although we need to keep making progress if we are to catch up to other industrializing and industrialized nations as shown in the graph below.²⁵



Saving Oil by Electrifying Transportation

Consumers deserve more efficient vehicles, and they deserve more clean energy options, as I wrote several years ago:

Currently, vehicles and fuels are a far cry from offering consumers real choices, and odds are good that the car you like isn't available in a hybrid-electric version. At most retail gas stations, the only products under the canopy are made from petroleum. In this regard, car dealerships and gas stations are more like shelves in a Soviet grocery store than a modern American retail outlet. Consumers demand, and deserve, more choices.²⁶

This remains largely true, although progress towards a world with more choices has accelerated in the past few years, driven by policy and prices. Pluggable cars have attracted a great deal of attention from policymakers and reporters, for example, and with good reason.

Driving on electricity from the grid is virtually free of oil. (In 2009, less than 1% of electricity generation came from petroleum liquids or coke.²⁷) Plug-in electric vehicles arriving in the market over the next couple of years are expected to cover the bulk of daily driving needs with electricity. According to the Department of Energy, personal vehicles are typically used for less than 30 miles per day.²⁸ The Nissan Leaf, available in some states starting this year, is expected to travel 100 miles on a charge. The Chevy Volt plug-in hybrid, also expected to be released this year, will have an expected electric range of 40 miles.

Transitioning our petroleum-powered light-duty vehicle fleet to one running primarily on grid electricity can deliver massive oil savings for our country. Recent analysis by the Environmental Protection Agency, in response to a request from Senator Kerry, shows that a future fleet comprised of a combination of electric-drive vehicles and cleaner, more efficient combustion vehicles could cut light-duty vehicle oil consumption 20 to 42 percent, or 2.1 to 3.1 million barrels per day, in 2030. To reach these goals, EPA assumed new passenger vehicles sales twenty years from now are one-third [32%] to nearly half [47%] comprised of electric vehicles and plug-in hybrid electric vehicles.

Vehicle electrification can also dramatically reduce global warming pollution. Considering today's electricity production mix, an electric-drive vehicle could emit just half the emissions of today's conventional combustion engine car. However, emissions benefits are maximized by charging with cleaner grid resources, especially renewable sources like wind and solar. Any electric vehicle running on the power of the sun is truly zero emissions.

The transportation bill should support the electrification of our transportation system, which is currently 97 percent dependent on petroleum. We can accelerate the transition to low carbon mobility by evaluating the need for and installing public charging infrastructure. Projects that connect transit with short-range electric vehicles can get

people out of long-distance drives without having to run transit to every location. Beyond passenger vehicles, transportation funds should go to encourage maximum reductions in global warming pollution in heavy-duty and non-road applications that are amenable to electrification, such as at truck stops and in port drayage operations.

Given the need to proceed strategically with vehicle electrification, it is important to develop a multi-year, multi-step policy. One proposal worthy of consideration was recently put forward by the Electrification Coalition, whose members include Peter Darbee of Pacific Gas & Electric, Carlos Ghosn of Nissan Motor Company and Fred Smith of FedEx. The coalition initiative would create “ecosystems” – defined as “a group of interdependent entities that work or interact together to accomplish a common task or goal” and meant to include electric and transportation sector representatives among others -- in select large metropolitan regions.²⁹ These ecosystems would be launched in two phases, with the purposes of showing “proof of concept,” driving economies of scale and allowing “learning by doing.” This is a useful concept which could eventually be implemented by a collaborative initiative between the Departments of Transportation, Energy, Housing and Urban Development as well as the Environmental Protection Agency to accelerate electrification at the regional level.

NRDC Priorities for Transportation Policy

NRDC recommends that this Committee and others tasked with writing the next transportation law focus on three key outcomes:

- **Reducing U.S. transportation sector oil use and greenhouse gas pollution:** The first of these can be accomplished by overhauling the program such that a greater portion of the funding is distributed in mode-neutral, performance-driven ways as described by groups including the Bipartisan Policy Center in a recent report.³⁰ Oil savings and greenhouse gas pollution criteria can also be built into transportation planning processes, with added incentives to promote projects that achieve both goals.
- **Increase the number of locations that are accessible by transit, biking and walking:** Providing Americans with more transportation choices will improve quality of life in neighborhoods across the country. This can best be achieved by increasing funding for clean transportation projects and by reforming transportation planning in order to link transportation and land use.
- **Spur creation of good jobs with clean transportation investments:** Smart technology can help improve both highway and transit systems, and the new bill should have an ITS title. Additionally, it should include transit manufacturing and workforce development incentives.

NRDC is also a proud member of Transportation for America, a diverse and growing effort to reform transportation policy. The blueprint, *The Route to Reform*, is a comprehensive map for enactment of a new transportation that would save oil and cut

pollution, including proposed objectives, performance targets, program structure and revenue options.³¹

NRDC and Transportation for America proposals take serious steps towards energy, economic and environmental security. I have also joined an unusually broad right-left coalition which has developed a complementary set of proposals for saving oil through transportation policy, as described below.

Saving Oil by Delivering Mobility Choice

Raising the bar on fuel economy performance of our vehicles and providing consumers with more fuel choices are key components of a three-pronged attack on oil dependence. The third is greater mobility choice. This is most relevant to the transportation bill, since it has helped determine transportation options available – or not – to Americans since at least the National Interstate and Defense Highways Act (P.L. 84-627) enacted in 1956.

In fact, some respected conservative advocates have proposed a new national program of a similarly audacious scale, a “National Defense Public Transportation Act.” This act would maintain existing services, provide transit service to any county in the nation that opts into the program, build new intercity rail, and then electrify rail across the country. This proposal deserves serious consideration, especially by moving forward with what the authors call a “skeletal national public transportation network,” explaining that

If (or when) interruptions to the country’s oil supply become chronic, we can quickly put more flesh on the skeleton by adding more buses and trains. It is much easier to build up something that already exists than to create it from scratch in time of national emergency. Even a thin, skeletal network, national in scope, would give us the “virtual” energy independence national security demands.³²

A national survey performed just last month shows there’s support for this kind of proposal. More than four-in-five voters say that “the United States would benefit from an expanded and improved public transportation system, such as rail and buses” with a majority saying the “strongly agree.” Two-thirds say they “would like more transportation options” and 73% feel they “have no choice but to drive as much as” they do.³³

Growing public demand is one reason I am collaborating with an unusually broad set of energy and transportation experts interested in transportation reform. Launched in December, the *Mobility Choice* project was initiated by the Institute for the Analysis of Global Security (IAGS), and our blueprint for transportation reform has ten elements as described below.³⁴

Ensure the Price of Fuel Better Reflects Oil Security Costs

To better reflect the hidden costs of oil, primarily those associated with its national security impact, an oil security fee could be levied either per barrel or at the pump. This fee would send a more accurate signal to consumers about the real cost of their gallon of gasoline or diesel. Reflecting the hidden costs of oil at the pump would enable consumers

(assuming modal choices exist and vehicles are platforms on which fuels can compete) to make more economically informed transportation choices.

The amount of oil saved through an Oil Security Fee would depend on the amount of the fee. **For example, implementing a fee equivalent to an additional 25 cents per gallon of gasoline in 2020 could generate annual savings of almost 240 million barrels of oil and generating \$44 billion of revenue.** Motor fuel taxes are particularly effective policy tools for saving oil for two main reasons. First, they are completely comprehensive: they put a price on every mile driven in the U.S. Secondly, these fees provide an incentive to drivers to take action on both the number of miles they drive *and* the fuel economy of the vehicles they own. Faced with a fuel tax, drivers can minimize cost by finding ways to drive less and by buying vehicles with better fuel efficiency.

Deploy “HOT” lanes and Congestion Pricing

The concept of pricing to address congestion was first proposed by Nobel Laureate William Vickrey about fifty years ago and at present the federal program has supported more than 50 projects in more than a dozen states with more than 20 projects in operation.³⁵ The use of this tool helps to address a “tragedy of the commons” issue with transportation, whereby public goods are consumed inefficiently due to a lack of accurate price signals unlike, for example, time-variable prices for daytime cell use and midday electricity use.

The source of funding for the Highway Trust Fund – used to construct new highway, bridge and tunnel infrastructure and to maintain the current system – could be shifted more strategically to rely more on user fees such as tolls and congestion pricing. For instance, federal policy could allow and encourage the National Highway System to implement pricing when congestion reaches a certain threshold. User fees can help reduce congestion by providing incentives to forego discretionary trips or to travel in off-peak periods; this reduces oil consumption by decreasing the amount of driving done in stop-and-go traffic. An emphasis on roadway-based user fees may also help ensure that transportation investments are made where demand – and therefore toll revenues – are highest, ensuring the best use of highway dollars.

There are a number of different options for implementing user fees, including:

- Congestion pricing: Variable tolls can be implemented on congested roadways so that the toll cost is set to reduce traffic jams and achieve a specified level of service on the roadway. This can include time-of-day pricing in which higher tolls are charged during peak hours, or more sophisticated dynamic pricing in which toll rates vary depending on the real-time level of congestion being experienced on the roadway. Dynamic pricing can be used to ensure that the road stays at a constant high level of service.
- HOV/managed lanes: Both HOV lanes and high-occupancy toll (HOT) lanes provide a separate lane for carpoolers with a higher level of service. HOT lanes also allow single-occupant vehicles into these lanes for a toll; this toll - in another form of

congestion pricing - can vary according to traffic levels to ensure a high level of service in the lane. Vehicles carrying two or more people (or three or more, depending on the level of congestion) would be exempted from the toll, to encourage carpooling.

- Intercity tolls: Outside urban areas, interstates and other limited access roads can be tolled to introduce a per-mile (or equivalent) fee to users.
- Truck-only toll lanes: Toll lanes dedicated exclusively to trucks allow freight to move more efficiently through congested areas. In addition, truck-only lanes may have safety benefits by separating truck and auto traffic.

Such strategies have been deployed more aggressively elsewhere in the world, including Singapore, London, Stockholm and the Netherlands. Political and public acceptance has been a challenge in many cases, with lessons that could be useful in the United States. Specifically, to earn support from the public and other stakeholders – including environmental groups – proposals must address a real problem that pricing would help resolve (such as oil savings), have a credible plan for the revenues including investments in transportation alternatives such as bus rapid transit, come from a trustworthy source and start incrementally.³⁶ The last of these is particularly important. Launching modest-sized projects can offer the public “proof of concept” and build momentum towards wider use of pricing tools.

Together, these user fee strategies could save nearly 80 million barrels of oil in 2020, and twice that in 2030 as pricing becomes more comprehensive. More than three-quarters of these reductions are associated with congestion pricing. This is because more than one-third of U.S. highway travel occurs on congested urban roadways; focusing on these roads gets to the core of the fuel consumption issue. As with all pricing mechanisms, benefits are achieved both because of the reduction in the number of miles driven and by better traffic flow that decreases the amount of time spent – and fuel consumed - in stop-and-go conditions.

Allocate Transit Dollars to Optimize Oil Savings

Providing transportation choices can be an effective way to reduce oil consumption – as long as there are enough riders that the transit vehicle consumes less oil per passenger than those riders collectively would have consumed driving their individual cars. The transit routes that have the highest load factors, therefore, save the most oil. Taxpayer dollars allocated to transit can be focused on capital improvements that would:

1. Improve service on, and recapitalize to maintain a state of good repair, existing high load routes with an eye toward maintaining a consistently high load factor. For instance, this might mean more frequent service during peak usage hours; this would reduce travel times, which would in turn attract even more riders.
2. Add new routes that are expected to be consistently high load.

Adding transit service attracts more riders, by providing new mobility options that make it worthwhile for them to switch modes. A number of strategies can contribute to

improved service levels and expand service to additional new routes. Technology can play an important role in increasing speed and reliability through signal prioritization and synchronization, automatic vehicle location systems for real-time scheduling adjustments, and improved fare collection such as integrated transit fare systems that allow riders to use a single smartcard for all the modes and systems they may want to use. Service improvements - such as express, limited stop service – can provide new options for riders. More capital-intensive options focus on adding more buses and rail vehicles to increase the frequency of service and to allow transit systems to expand to cover larger geographic areas. For instance, bus rapid transit (BRT) – as demonstrated most extensively in cities such as Bogota (Colombia) and Curitiba (Brazil) – provides a flexible and cost-effective way to provide much higher levels of service than traditional bus service, often by using a dedicated right-of-way to avoid congestion and reduce conflicts with general traffic. Compared to heavy or even light rail projects, BRT costs less and takes less time per mile to build, and operations costs are also lower.

Our analysis shows that increasing the level of service on routes that have better than average load factors could save more than 4 million barrels of oil in 2020, and more than 6 million in 2030. Expanding service to reach new geographic areas, assuming again that only routes with better than average load factors would be funded, could save almost 21 million barrels of oil in 2020 and more than 38 million barrels in 2030.

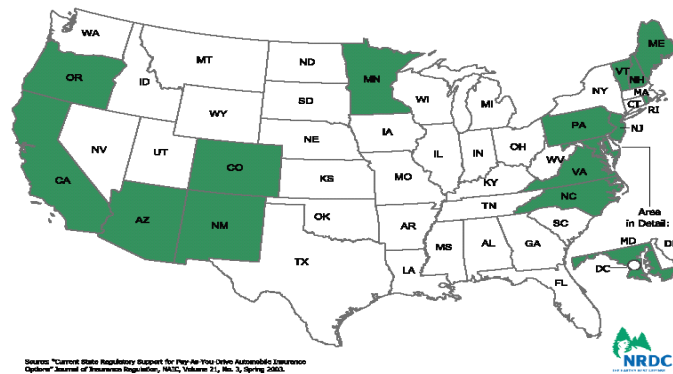
Increase Insurance Choice

Car insurance is a fixed-cost for most drivers in the U.S. today – they pay the same amount per year regardless of how many miles they drive. Yet, all else being equal, the likelihood of an accident for a given driver increases as he or she drives more. As a result, low-mileage drivers effectively are subsidizing risk for high-mileage drivers; this results in distorted price signals for the costs of driving. Converting the variable portion of insurance costs into a per-mile cost for drivers – a system known as Pay as You Drive (PAYD) - will correct these price signals. Research shows that the majority of drivers in the U.S. would *actually save money* under such a system, since the current subsidy to the smaller pool of relatively high-mileage drivers would be eliminated.

States are taking note of the advantages and pollution reductions afforded by PAYD. No fewer than 14 states are relying on PAYD as a strategy to combat global warming pollution, and expect PAYD alone to contribute on average 3% of their state's total emissions reduction. In all cases, PAYD is projected to have either no cost or to result in net savings.

PAYD in State Climate Action Plans

Nearly 25% of All Driving in America



Slide

In spite of increasing interest among states there are very few PAYD policies available. The overwhelming majority of Americans continue to drive with one-price-fits-all policies and virtually no insurance companies offer PAYD. The reasons for this include:

- **State Regulations:** In 2003, the Georgia Institute of Technology surveyed states' insurance regulations for their compatibility with PAYD, and found more than 15 states with regulatory obstacles. Since then, California, for one, has moved to permit PAYD, but work remains to be done in other states.
- **Administrative Start-Up Costs:** Many insurers are unwilling to explore PAYD because of uncertain start-up and administrative costs. In most cases PAYD will require, at a cost, that insurers enact actuarial and administrative changes to incorporate the new verified mileage with risk and premium costs. Although insurers stand to benefit from the increased actuarial accuracy that will result in most cases, these benefits are not immediately apparent to them, especially in an industry as competitive as auto insurance.
- **Verification Costs:** An essential element of PAYD is to guarantee insurers the right to verify mileage and adjust premiums accordingly. Many insurers are unsatisfied with current methods of mileage collection and their attendant cost. While many prefer proprietary devices that can collect mileage, such devices face significant privacy concerns and general market acceptability questions. Insurers appear to lack confidence in the ability of drivers or other 3rd parties to accurately and honestly report their mileage to them.
- **Lack of Consensus:** After literally decades of PAYD as a subject of policy debate and speculation, there is still not a consensus definition of PAYD. This makes it difficult for policymakers and regulators, not to mention insurers and consumers, to identify exactly what they are striving for.

To implement PAYD, state regulations that prevent insurance companies from offering consumers the option of pay-as-you-drive insurance would first need to be lifted. Federal discretionary dollars can be used aggressively to finance research by the Transportation Research Board (TRB) on how such policies could be structured, and to quantify the relative benefits of different mileage-verification methods (some of which may have a greater impact on driver behavior by sending more frequent price signals). The federal government can also develop guidance on how PAYD legislation and regulations can be structured, finance pilot demonstrations of the PAYD concept, and provide incentives to insurance companies to offer PAYD insurance. For example, auto insurance companies offering PAYD insurance policies could receive a 20% fully-refundable business tax credit based on a portion of active PAYD policies.

A standard definition of PAYD would also be helpful. In concert with current Congressional efforts to create HomeStar and BuildingStar programs for energy efficient buildings, EPA could create specifications for PAYD—an “ENERGY STAR for Auto Insurance” or “DriveStar”—to provide guidance to regulators, policymakers, insurers and even consumers who are interested in proposing, evaluating and encouraging PAYD-type insurance products. NRDC, with Ceres and others, has developed such a standard as a starting point.

If PAYD policies were made an option for all drivers, between 20-40 percent of drivers could be expected to use it as a way to reduce auto insurance premiums. **Allowing PAYD as an option in all states could generate savings of 56 million barrels of oil in 2020 and almost 60 million in 2030.**

Provide Transit Vouchers for Mobility Choice for Low-Income Households

While lowering transit fares is a proven way to increase ridership, this comes at a cost to transit agencies in the form of lower farebox revenues – undercutting agencies’ ability to maintain service in the long run. To allow transit agencies to become more self-sustaining while meeting mobility goals, subsidies can be focused on helping the people that actually need financial support. To this end, transit vouchers could be provided for low-income households, paid for by fare increases for other riders. This policy would help transit agencies avoid farebox losses by giving them the chance to charge higher fares for consumers who can afford it. Policies could be designed so that vouchers could be redeemed with either existing transit agencies or private entrepreneurs running private sector buses, shuttles, vanpools and jitney buses.

Research shows that lower- and higher-income riders have different responses to fare price changes, with lower-income riders more sensitive to cost. As a result, our analysis shows that the ridership gains from subsidies to low-income riders outweigh the ridership losses from higher-income riders who switch to other modes when faced with fare increases. This analysis recognizes that subsidies will attract some new transit riders who will switch from non-auto modes (such as walking or bicycling) that consume no oil. **Even accounting for the relatively higher share of low income transit riders who will make this switch, providing low-income fare subsidies would save nearly 0.7 million barrels of oil each year.**

Increase Commuting Options and Telecommuting

A large share of trips are -- particularly at peak hours -- to the workplace. There are many strategies that can encourage commuters to choose travel options other than driving alone. For example, parking cash-out programs reward employees who find other ways to get to work by giving them the cash-equivalent to a parking benefit. On-line ride matching, vanpool services and guaranteed ride home programs provide commuters an alternative to driving alone. Extensive outreach programs by larger employers can be used to educate employees about the commute options available. Transit agencies can offer employers “bulk discounts” on monthly transit passes, providing incentives for greater transit use. Finally, government employers can levy a fee (such as four dollars per parking space per day) on employee parking that can be used to fund the provision of these shared-ride programs and transit passes. **Implementing all of these strategies could yield oil savings of more than 57 million barrels of oil each year.**

Telecommuting and compressed work weeks offer opportunities to eliminate entirely some trips to the workplace. The choice to take the “broadband highway” to work, shop or run errands saves more oil than any alternate mode of transport. As one energy expert put it, “consider the potential of virtualization as a disruptive energy technology. If for only one day a week the herd of stop-and-go business commuters was allowed to telework from home or from a networked satellite office near their neighborhood, over 30 million gallons a day of gasoline would be saved.”³⁷ While telecommuting is on the rise, there are ways that policy measures can accelerate this trend. First, government agencies could set a good example by encouraging telecommuting and a compressed workweek of its workforce, as appropriate depending on job descriptions and citizen needs. Barriers to telecommuting in state and local tax codes can be eliminated, and tax incentives can be provided for telecommuting setup and maintenance costs, similar to the tax free benefits currently provided for other workplace transportation costs (parking and transit use). **Fully implementing these actions would save another 14 million barrels of oil each year.**

Return Gas Tax Revenue to Areas with the Most Traffic and Oil Savings Potential

Our nation’s metropolitan areas have grown into hosts to most of the nation’s population, employers, GDP and traffic. They are therefore logical recipients of a larger proportion of federal gas tax receipts, as recognized by both the Bush Administration and Democratic Transportation Committee Chairman Rep. James Oberstar, who both included substantial metropolitan mobility programs their proposals for a new transportation program. Any new program should send a much larger proportion of gas tax receipts – either through a brand-new program or through the existing Surface Transportation Program – directly to metropolitan regions in a process referred to as “suballocation,” with appropriate conditions to maximize efficient and transparent use of the funds. One condition could be to focus support for transit operations on high-load routes. This strategy is supportive of others on this list, and its oil savings are difficult to estimate in isolation.

Improve Local Land-Development Rules

Transportation choices and land use are inextricably linked. By creating more transportation-efficient land use patterns, people can choose modes other than driving for some trips, and reduce the number of miles they need to drive. Mixing commercial and residential land uses makes it possible for residents to walk or bicycle to neighborhood stores, and higher density development centered around transit stops can make public transportation a much more attractive and viable option for residents. Yet current regulations often stand in the way of neighborhood designs that allow minimal driving, with zoning codes that prohibit mixed-use developments and that do not allow for a mix of housing types and lot sizes. Government policies need to be revamped to encourage – rather than impede – efficient development patterns, and eligibility of municipalities for certain federal transportation funds should be conditioned on liberalization of rules to meet market demand.

Some recent analyses provide evidence of a mismatch between what the marketplace provides and changing consumer preferences. One analysis looked at Atlanta households and found that “the segment of the housing market that is interested in these alternatives is underserved—that is, there is unmet demand for alternative development in the Atlanta region.”³⁸ Another analysis compared Boston and Atlanta, finding that 70% of Bostonians who wanted to live in a walkable suburb actually did while only 35% of the same in Atlanta did.³⁹

And a national survey of developers found that more than 60% agreed with the statement “In my region there is currently enough market interest to support significant expansion of these alternative developments,” with a high of 70% in the Midwest and a low of 40% in the South Central region. In terms of location within metropolitan regions (central city, inner suburb, outer suburb, or rural) the highest percentage (80%) reported an intent to develop more densely should land-use regulations be relaxed in inner suburbs.⁴⁰

Merely removing barriers to mixed-use development and providing incentives for regional and city planning agencies to plan for more efficient land use could save more than three million barrels of oil in 2020. This initial savings would more than triple by 2030 as these policies have more time to influence development. Due to the length of time it takes for individual properties to turn over to new uses and development patterns to change, incentives for land use changes represent a long-term policy option. Many of the most powerful effects of implementing these policies will be felt beyond the 2030 timeframe.

Deployment of Smart Traffic Management

Traveling on roads and transit in other industrialized nations, one witnesses a host of technologies that could improve operating efficiency of existing transportation modes, from variable signage providing real-time information to system users to traffic management centers to keep traffic flowing freely. Upgrading our current infrastructure with 21st-century technology is one of the first steps we can take to save oil and reduce pollution by reducing congestion and idling. These technologies save time, money, and

frustration for travelers. A wide range of technologies and operational improvements can be implemented. Here are some of the strategies for improving traffic flow for cars, trucks and buses on our roads:

- Freeway management. Roadway capacity and flow can be dynamically managed with real-time information on traffic conditions, collected by sensors and cameras. Ramp meters can be installed to regulate the flow of vehicles entering a highway to the optimal level at any given time, speed limits can be adjusted in real time to respond to changing conditions, and shoulders can be converted to travel lanes at peak hours or during congestion. Traffic management centers can coordinate ITS technologies across multiple roadways to best reduce congestion area wide.
- Traveler information. Up-to-date information on traffic conditions provided to travelers can enable them to choose the best route and avoid congestion. Variable message signs, 511 systems, and traveler information call centers can all be deployed.
- Incident management. A variety of techniques can be used to more quickly identify and clear incidents (accidents and other obstructions) that are causing traffic jams, including free cellular call systems for reporting incidents, closed-circuit cameras, service patrols, and travel management centers to coordinate response.
- Arterial management. Improved signal synchronization and variable message signs can be used to improve traffic flow on arterial roadways. This can also be combined with priority access through intersections for transit.
- Road weather management. Inclement weather can badly snarl roadways. Implementing coordinated weather advisories, speed limit reductions, and snow and ice treatments promotes safe and smooth travel operations in bad weather.
- Vehicle Infrastructure Integration (V2X) or IntelliDriveSM. Not yet widely deployed, these systems would equip vehicles with technology that would communicate with roadside sensors and other vehicles to help drivers avoid accidents and make efficient use of roadway capacity.
- Truck idling reduction. Idling wastes both fuel and money for trucking companies and operators. Overnight idling at truck stops can be reduced through truck stop electrification, which provides heating and cooling for the driver in the sleeper cab, or by installing auxiliary power units on trucks that allow drivers to shut off the main engine. Weigh-in-motion (WIM) systems and electronic credentialing allow trucks to bypass weigh stations and safety inspections, eliminating the idling associated with these stations.

Together, these technologies could save almost 5 million barrels of oil in 2020 and almost 10 million barrels in 2030, while simultaneously improving traffic flow on arterials and freeways in the nation's congested urban areas.

Deploy Cost-Effective Intercity Rail Options as Justified by Cost Efficiency and Oil Displacement Potential

For medium distance trips, intercity rail offers the opportunity to switch intercity auto and air trips to more energy-efficient trains. As with transit expansion, the greatest oil saving benefits can be gained by implementing service with relatively high load factors, rather than introducing service with low ridership. Federal funds for rail can be targeted to expand service on lines that will attract enough ridership to operate with relatively high load factors.

Leveraged targeting of investments will require development of criteria and a phase-in approach for new capacity. One noteworthy white paper by America 2050 lays out a methodology for screening potential city pairs that could be linked by high-speed rail based on six criteria aimed at ensuring adequate ridership: Metropolitan size, distance, transit connections, economic productivity, congestion (for both auto and air travel) and whether or not pairs are part of one of 11 “megaregions” that are already interconnected in various ways. Based on these criteria, as part of a three-phase investment plan the group proposes first building new rail connections in Northeastern, Midwestern and California megaregions. This method is worthy of consideration whether or not new rail capacity is “high speed.”⁴¹

If funds are dedicated to expanding ridership on routes with at least 20 percent higher load factors than the Amtrak average, funding intercity rail could save half a million barrels of oil per year. Intercity rail strategies will also have synergies with transit expansion strategies, because better transit systems in destination cities reduce the need for passengers to have a car upon arrival. This further reduces the incentive for travelers to drive.

Securing our Energy and Climate Future

Moving forward into the second decade of the new millennium, we have a chance to chart a new course for the future. When I envision my daughter in adulthood, I see a nation and a world that offers more means to opt out of oil addiction. Fareed Zakaria has written about one exciting vehicle choice that should be available in the future: The 500-mpg car, an pluggable car that can run on a blend of advanced biofuel and traditional fossil fuel.⁴² Between the electricity and the biomass, this car would dramatically reduce the number of times you have to go to the pump, and in aggregate would cut our dependence on oil.

In addition, I see a real network of public and private transportation options linking cities and towns across the country, with neighborhoods retrofitted or designed from the start with walkability and bikeability in mind. An array of real mobility choices for U.S. citizens would further boost energy independence. Such a bright future is contingent on enactment of new transportation policy, led by this Committee. I look forward to working with you to make it so.

-
- ¹ Energy Information Administration, *Annual Energy Review 2008*, Transportation Sector Energy Consumption, <http://www.eia.doe.gov/emeu/aer/txt/ptb0201e.html>
- ² Energy Information Administration. *Annual Energy Outlook 2010* Early Release.
- ³ Maugeri, L. 2006. *The Age of Oil*. Westport, CT: Praeger.
- ⁴ Import figure drawn from Jaffe, A.M. 2009. *The U.S. Energy Predicament*. The Aspen Institute Congressional Program Vol. 24, No. 2: 11.
- ⁵ 90 percent figure from Marcel, V. 2006. *Oil Titans: National Oil Companies in the Middle East*. London: Chatham House. Figures for graph from Maugeri, L. 2006. *The Age of Oil*. Westport, CT: Praeger.
- ⁶ Lee, H. 2009. *Oil Security and the Transportation Sector in Acting in Time on Energy Policy*, edited by K.S. Gallagher, 56-88. Washington, D.C.: The Brookings Institution.
- ⁷ Electrification Coalition. November, 2009. *Electrification Roadmap: Revolutionizing Transportation and Achieving Energy Security*. Washington, D.C.: Electrification Coalition.
- ⁸ Luft, G. and Korin, A. *Terror's Next Target*. *Journal of International Security Affairs* December 2003.
- ⁹ From chapters by Koknar, Ali and Jaffe, A.M. 2009. *The Epidemic of Energy Terrorism and OPEC: An Anatomy of a Cartel* respectively in *Energy Security Challenges for the 21st Century*, edited by G. Luft and A. Korin, 18-30 and 78-90 respectively. Santa Barbara, CA: Praeger Security International.
- ¹⁰ Klare, M. 2009. *There Will Be Blood: Political Violence, Regional Warfare, and the Risk of Great-Power Conflict over Contested Energy Resources* in *Energy Security Challenges for the 21st Century*, edited by G. Luft and A. Korin, 44-65. Santa Barbara, CA: Praeger Security International
- ¹¹ Jaffe, A.M. 2009. *OPEC: An Anatomy of a Cartel* in *Energy Security Challenges for the 21st Century*, edited by G. Luft and A. Korin, 78-90. Santa Barbara, CA: Praeger Security International.
- ¹² Oil Shockwave, "Video Samples," *Securing America's Future Energy*, <http://www.secureenergy.org/site/page.php?node=344&id=93>
- ¹³ Friedman, Thomas L. "9/11 and 4/11." *New York Times*, July 20, 2008, <http://www.secureenergy.org/site/page.php?node=344&id=93>
- ¹⁴ The CNA Corporation. 2007. *National Security and the Threat of Climate Change*. Alexandria, VA: The CNA Corporation.
- ¹⁵ Ibid.
- ¹⁶ Department of Defense. February, 2010. *Quadrennial Defense Review Report*. Washington, D.C.: Department of Defense.
- ¹⁷ See for example Bordetsky, A., et al. June, 2007. *Driving It Home: Choosing the Right Path for Fueling North America's Transportation Future*. New York, New York: Natural Resources Defense Council.
- ¹⁸ Maugeri, L. 2006. *The Age of Oil*. Westport, CT: Praeger.
- ¹⁹ Parry, W.H. and Anderson, J.W. Winter 2005. *Petroleum: Energy Independence is Unrealistic*. *Resources* 156: 11-15.
- ²⁰ Greene, D. *Why CAFE Worked*. 1997. Oak Ridge, Tennessee: Oak Ridge National Laboratory.
- ²¹ Korin, A. and Luft, G. 2009. *Turning Oil into Salt: Energy Independence Through Fuel Choice*. BookSurge Publishing.
- ²² Woolsey, R.J. and Sexton, C. 2009. *Geopolitical Implications of Plug-in Vehicles in Plug-In Electric Vehicles: What Role for Washington?* Edited by D.B. Sandalow, 11-21. Washington, D.C.: Brookings Institution.
- ²³ Greene, D. *Why CAFE Worked*. 1997. Oak Ridge, Tennessee: Oak Ridge National Laboratory.
- ²⁴ U.S. EPA. 2009. *Fuel Economy Trends Model Years 1975-2009*.
- ²⁵ The International Council on Clean Transportation (ICCT), "Passenger Vehicle Greenhouse Gas and Fuel Economy Standards: A Global Update," ICCT, http://www.theicct.org/information/reports/passenger_vehicle_greenhouse_gas_and_fuel_economy_standards_a_global_update
- ²⁶ Lovaas, D. 2007. *Going Green by Empowering Choice* in *The Futurist* January-February 2007: 27.
- ²⁷ EIA, *Electric Power Monthly, Net Generation by Source*, Table 1.1, March 2010.
- ²⁸ Davis, Diegel and Boundy, *Transportation Energy Data Book: Edition 28*, Oak Ridge National Laboratory for the US Department of Energy, 2009.
- ²⁹ Electrification Coalition. November, 2009. *Electrification Roadmap: Revolutionizing Transportation and Achieving Energy Security*. Washington, D.C.: Electrification Coalition.

-
- ³⁰ Bipartisan Policy Center. 2009. *Performance-Driven: New Vision for U.S. Transportation Policy*. Bipartisan Policy Center.
- ³¹ Transportation for America, *The Route to Reform*, Transportation for America <http://t4america.org/blueprint/>
- ³² Weyrich, P.M. and Lind, W.S. 2009. *Moving Minds: Conservatives and Public Transportation*. Alexandria, VA and Oakland, CA: The Free Congress Foundation and Reconnecting America.
- ³³ Pre-release data from A National Transportation Survey of 800 Registered Voters Conducted February 27-March 2, 2010 by Public Opinion Strategies and Fairbank, Maslin, Maullin, Metz & Associates for Transportation for America, Smart Growth America and NRDC.
- ³⁴ The coalition is made up of myself as well as the following individuals (organizations listed for affiliation purposes): Anne Korin and Gal Luft of IAGS; Cliff May of the Foundation for the Defense of Democracies; Robert McFarlane, former National Security Advisor; R. James Woolsey, former CIA director; James Strock, former California Secretary of the Environment; John Norquist, President of the Congress for the New Urbanism; Matt Rojansky, Partnership for a Secure America; Kenneth Green of the American Enterprise Institute; Peter Pantuso of the American Bus Association; Admiral Dennis McGinn; Chuck Wilsker of the Telework Coalition; and Lisa Margonelli of the New America Foundation.
- ³⁵ Buxbaum, J. N. 2009. Transportation Research Board. 2009. Transportation Research News 263: 4-7.
- ³⁶ Higgins, T. 2009. Transportation Research Board. 2009. Transportation Research News 263: 32-34.
- ³⁷ Tertzakian, P. and Hollihan, K. 2009. *The End of Energy Obesity: Breaking Today's Energy Addiction for a Prosperous and Secure Tomorrow*. Hoboken, NJ: Wiley.
- ³⁸ Levine, Jonathan, and Lawrence Frank. (2007) *Transportation and Land-Use Preferences and Residents' Neighborhood Choices: The Sufficiency of Compact Development on the Atlanta Region*. Transportation 34(2):255-274.
- ³⁹ Levine, Jonathan, Aseem Inam and Gwo-Wei Torng. (2005) *A Choice-Based Rationale for Land-Use and Transportation Alternatives: Evidence from Boston and Atlanta*. Journal of Planning Education and Research 24(3):317-330.
- ⁴⁰ Levine, Jonathan and Aseem Inam. (2004) *The Market for Transportation-Land Use Integration: Do Developers Want Smarter Growth than Regulations Allow?* Transportation 31(4):409-427.
- ⁴¹ Hagler, Y. and Todorovich, P. 2009. *Where High-Speed Rail Works Best*. New York, New York: America 2050.
- ⁴² Zakaria, F. *Imagine: 500 Miles per Gallon* in *Newsweek* March 7, 2005.